In the Claims

1. (currently amended) A method for encoding a video including a plurality of objects, comprising:

determining, for each candidate object, a quantizer parameter and a skip parameter that jointly minimizes an average total distortion in the video while satisfying predetermined constraints, the average total distortion including spatial distortion of coded objects based on the quantizer parameter, and spatial and temporal distortion of uncoded objects based on the quantizer parameter and the skip parameter; and

encoding the candidate objects as the coded objects with the quantizer parameter and the skip parameter, and skipping the candidate objects as the uncoded objects with the skip parameter.

2. (original) The method of claim 1 wherein the object is a video object plane having an arbitrary shape and size.

3. (original) The method of claim 1 wherein the object is a video frame having a rectangular shape and fixed size.

4. (original) The method of claim 1 wherein the skip parameter is f_s, and further comprising:

skipping $(f_s - 1)$ uncoded objects.

5. (original) The method of claim 1 further comprising:

encoding multiple candidate objects concurrently.

6. (original) The method of claim 1 wherein an average skip parameter is $\overline{f}_s = \frac{F_{src}}{\overline{F}}$, where F_{src} is a source frame-rate, and $\overline{F}$ is an average coded frame rate.

7. (original) The method of claim 1 wherein the average total distortion is

$$\arg\min_{[Q_{i+f_s}, f_s]} \overline{D}_{[t_i, t_{i+f_s}]}(Q_{i+f_s}, f_s)$$

wherein Q is the quantizer parameter, f_s is the frameskip parameter, and the predetermined constraints are

$$s.t. \quad \begin{cases} \overline{R} \le R \\ B_i + R(t_{i+f_s}) < B_{\max} \\ B_i + R(t_{i+f_s}) - f_s \cdot R_{drain} > 0 \end{cases}$$

R is a target bit-rate, $B_{\max}$ is a maximum buffer size in bits, B_i is a current buffer level, and R_{drain} is a buffer drain rate.

8. (original) The method of claim 1 further comprising:

initializing f_l to 1;

a) setting a maximum skip parameter to $f_s = \max\{1, f_l - \delta\}$, $D_{\min} = \infty$ for a minimum distortion D_{min};

b) determining a target number of bits for the candidate object;

c) determining a value of the quantizer parameter;

d) determining if the quantizer parameter and the skip parameter still satisfies the bit-rate and the buffer constraints;

e) determining a distortion;

incrementing the skip parameter as a new $f_s \leq \min\{f_l + \delta, f_{max}\}$ if false and repeating steps b-e until true;

determining if the average total distortion is minimized; and repeating the steps beginning at step a) otherwise.

9. (original) The method of claim 8 wherein the target bit rate is scaled to account for a current value of the skip parameter.